BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

In the Matter of	)	
	)	
PUBLIC UTILITIES COMMISSION	)	DOCKET NO. 2008-0273
	)	
Instituting a Proceeding to Investigate	)	HEARING DATE: _____
the Implementation of Feed-in Tariffs	)	HEARING TIME: _____
	)	

MOTION OF ZERO EMISSIONS LEASING LLC TO COMPEL HAWAIIAN ELECTRIC COMPANIES TO PROVIDE RESPONSES TO INFORMATION REQUEST

MEMORANDUM IN SUPPORT OF THE MOTION

ATTACHMENTS A – C

AND

CERTIFICATE OF SERVICE

FILED
2008 MAY -8 P 2:41
PUBLIC UTILITIES COMMISSION

ERIK W. KVAM
Chief Executive Officer
Zero Emissions Leasing LLC
2800 Woodlawn Drive, Suite 131
Honolulu, Hawaii 96822
Telephone: (808) 371-1475

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

In the Matter of	)	
	)	
PUBLIC UTILITIES COMMISSION	)	DOCKET NO. 2008-0273
	)	
Instituting a Proceeding to Investigate	)	HEARING DATE: _____
the Implementation of Feed-in Tariffs	)	HEARING TIME: _____
	)	

MOTION OF ZERO EMISSIONS LEASING LLC TO COMPEL HAWAIIAN ELECTRIC COMPANIES TO PROVIDE RESPONSES TO INFORMATION REQUEST

ZERO EMISSIONS LEASING LLC ("Zero Emissions") respectfully moves the Public Utilities Commission of the State of Hawaii (the "Commission") to compel Hawaiian Electric Company, Inc. ("HECO"), Hawaii Electric Light Company, Inc. ("HELCO") and Maui Electric Company, Limited ("MECO") (HECO, HELCO and MECO collectively, the "Hawaiian Electric Companies") to provide responsive answers to subsections (c) and (d) of Zero Emissions' Information Request ZE-IR-107 to the Hawaiian Electric Companies ("ZE-IR-107"). The Hawaiian Electric Companies' response to ZE-IR-107 is shown at Attachment C to the Memorandum in Support of the Motion (the "Memorandum") submitted herewith. ZE-IR-107 seeks information about the amounts by which deliveries of electricity from dispatchable or curtailable generating facilities to the utility's electric system can be and are reduced or curtailed by the utility during a 24-hour load cycle, and seeks information about the amount of electricity from renewable generating facilities (in-line hydropower, photovoltaic, concentrating solar and

onshore wind) that could be added or delivered to the utility electric system, without compromising the reliability of the utility electric system, by displacing, reducing or curtailing generation of electricity from existing non-renewable dispatchable generating facilities. As discussed in the Memorandum, this information is necessary for the Commission to make its decision whether to approve a feed-in tariff that dramatically accelerates the addition of renewable energy from new sources in Hawaii.

Accordingly, Zero Emissions respectfully requests that, for the reasons set forth in the attached Memorandum, the Commission:

(1) Direct the Hawaiian Electric Companies to provide responsive answers to to subsections (c) and (d) of Zero Emissions' Information Request ZE-IR-107 to the Hawaiian Electric Companies; and

(2) Such further relief as the Commission deems appropriate.

Zero Emissions requests a hearing on this motion. This motion is based upon Sections 6-61-16 and 6-61-41 of the Rules of Practice and Procedure of the Commission, Title 6, Chapter 61 of the Hawaii Administrative Rules, the attached Memorandum in Support of the Motion, and all relevant documents on file with the Commission.

* * * *

DATED: Honolulu, Hawaii, March 8, 2010

Erik Kvam
Chief Executive Officer
Zero Emissions Leasing LLC

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

In the Matter of	)	
	)	
PUBLIC UTILITIES COMMISSION	)	DOCKET NO. 2008-0273
	)	
Instituting a Proceeding to Investigate the Implementation of Feed-in Tariffs	)	
	)	

MEMORANDUM IN SUPPORT OF THE MOTION

I. INTRODUCTION

Zero Emissions Leasing LLC ("Zero Emissions") respectfully moves the Public Utilities Commission of the State of Hawaii (the "Commission") to compel Hawaiian Electric Company, Inc. ("HECO"), Hawaii Electric Light Company, Inc. ("HELCO") and Maui Electric Company, Limited ("MECO") (HECO, HELCO and MECO collectively, the "Hawaiian Electric Companies") to provide responsive answers to subsections (c) and (d) of Zero Emissions' Information Request ZE-IR-107 to the Hawaiian Electric Companies ("ZE-IR-107"). The Hawaiian Electric Companies' responses to ZE-IR-107 are shown at Attachment C to the Memorandum in Support of the Motion (the "Memorandum") submitted herewith. ZE-IR-107 seeks information about the amounts by which deliveries of electricity from dispatchable or curtailable generating facilities to the utility's electric system can be and are reduced or curtailed by the utility during a 24-hour load cycle, and seeks information about the amount of electricity from renewable generating facilities (in-line hydropower, photovoltaic, concentrating solar and onshore

wind) that could be added or delivered to the utility electric system, without compromising the reliability of the utility electric system, by displacing, reducing or curtailing generation of electricity from existing non-renewable dispatchable generating facilities. This information is necessary for the Commission to make its decision whether to approve a feed-in tariff that dramatically accelerates the addition of renewable energy from new sources in Hawaii.

II. DISCUSSION

In its Decision and Order filed September 25, 2009 (the "D&O"), the Commission stated that feed-in tariffs ("FITs") "were a possible mechanism 'to dramatically accelerate the addition of renewable energy from new sources' and to 'encourage increased development of alternative energy projects'." *D&O* at 13. The Commission said that it "will direct the HECO Companies to adopt FITs in their respective service territories ... consistent with the principles described below." *D&O* at 17. Those principles included a requirement that the HECO Companies "adopt standards that establish when additional renewable energy can or cannot be added on an island or region therein without markedly increasing curtailment, either for existing or new renewable projects. FIT generation should meet new load requirements and **displace fossil fuel generation** ... " [emphasis added] *D&O* at 50-51.

The National Renewable Energy Laboratory[1] has defined a "Feed-in Tariff (FIT)" as:

> A renewable energy policy that typically offers a **guarantee of:**
>
> 1. **Payments** to project owners for total kWh of renewable electricity produced

[1] Karlynn Cory, "Renewable Energy Feed-in Tariffs: Lessons Learned from the U.S. and Abroad (National Renewable Energy Laboratory, November 18, 2009), accessed at http://www.cleanenergystates.org/Meetings/RPS_Summit_09/Cory_RPS_Summit2009.pdf.

2. **Access to the grid**; and

3. Stable, long-term contracts (15-20 years)

Feed-in tariffs ("FITs") accelerate the addition of renewable energy from new sources and encourage increased development of alternative energy projects by obliging the utility to interconnect such projects (*i.e.*, a guarantee of access to the grid, provided the utility's reliability requirements are met), and by obliging the utility to purchase such renewable energy at a fixed long-term rate (*i.e.*, a guarantee of payments to project owners for total kWh of renewable electricity produced). FITs encourage accelerated development of renewable energy projects because these utility obligations give project developers the revenue certainty that they need to obtain financing for their projects.

FITs create revenue certainty by creating price certainty and quantity certainty. FITs create price certainty by specifying a fixed long-term rate at which the utility is obliged to purchase renewable energy. FITs create quantity certainty by obliging the utility to interconnect the renewable energy project (provided reliability requirements such as Rule 14H are met) for delivery of renewable energy to the utility, and by obliging the utility to purchase quantities of renewable energy generated by the project.

In creating a utility obligation under a FIT to interconnect as-available (intermittent) renewable energy generation (such as in-line hydropower, concentrating solar power, photovoltaic solar power and onshore windpower) to the utility's electric system, the Commission needs to know how much as-available renewable energy ***could*** be added to the grid of each island without compromising the reliability of the utility's electric system. The amount of as-available renewable energy that ***could*** be added to the grid of each island without compromising electric system reliability will depend on the

regulating capacity of the utility's must-run and dispatchable ***non***-renewable (i.e., fossil fuel) generation, taking into account any displacement of the utility's dispatchable non-renewable generation by the added as-available renewable energy generation.

In creating a utility obligation to purchase as-available renewable energy, the Commission needs to know: of the amount of as-available renewable energy that ***could*** be added to the grid of each island without compromising electric system reliability, how much of that amount ***should*** be added to the grid based on ***economic*** considerations. The amount of as-available renewable energy that ***should*** be added to the grid will depend on the economic costs and benefits of the added as-available renewable energy relative to any dispatchable non-renewable energy displaced by the added as-available renewable energy.

To determine a proper cap on the amount of as-available renewable energy that the utility should be obliged to purchase under a FIT, the Commission needs answers to the following two questions:

> **Question 1:** How much as-available renewable energy ***could*** be added to the grid of each island without compromising electric system reliability based on the regulating capacity of the utility's must-run and dispatchable non-renewable generation, taking into account any displacement of the utility's dispatchable non-renewable generation by the added as-available renewable energy generation?
>
> **Question 2:** How much of the as-available renewable energy that could be added to the grid of each island without compromising electric system reliability ***should*** the utility be obliged to purchase based on the relative costs and benefits

of the added as-available renewable energy and any dispatchable non-renewable energy displaced by the added as-available renewable energy?

Because the answer to Question 2 depends on the answer to Question 1, the Commission needs an answer to Question 1 to determine a proper cap on the amount of as-available renewable energy that the utility should be obliged to purchase under a FIT. Without an answer to Question 1, any cap on the amount of such as-available renewable energy, such as the Commission's initial cap of 5% of 2008 peak demand (*D&O* at 55), will be based on a guess by the Commission as to the amount of as-available renewable energy that could be added to the grid of each island without compromising electric system reliability. Without an answer to Question 1, the effective cap on the amount of such as-available renewable energy will be zero because the Commission cannot be sure that ***any*** addition of as-available renewable energy will not compromise the reliability of the utility's electric system.

The Commission recognized early on that an answer to Question 1 was necessary for the Commission to make an informed determination of how much as-available renewable energy the utility should be obliged to purchase under a FIT. In PUC-IR-1, shown at Attachment A hereto, the Commission asked the Hawaiian Electric Companies:

> For each island, with the current levels of demand, transmission, and supply resources, what is the maximum amount of total and additional intermittent resources that can be accommodated without compromising reliability?

The Commission characterized the Hawaiian Electric Companies' response to PUC-IR-1 as follows (*D&O* at 49):

> Citing the multiplicity of factors incorporated into reliability determinations, the HECO Companies declined at the panel hearing and in their submissions to define how much renewable energy each island could incorporate.

As a result of the Hawaiian Electric Companies' refusal to answer Question 1 (as put to the Hawaiian Electric Companies in the form of PUC-IR-1), the Commission set an initial cap, on the amount of as-available renewable energy that the utility would be obliged to purchase under a FIT (*D&O* at 55), based on a guess that as-available renewable energy in an amount equal to 5% of 2008 peak system demand ***could*** be added to the grid of each island without compromising electric system reliability. In directing the Hawaiian Electric Companies

> to develop reliability standards for each company, which should define most circumstances in which FIT projects can or cannot be incorporated on each island. ... The standards should complement existing standards, including those in the HECO Companies' tariff Rule 14, and should provide greater predictability with respect to reliability issues for developers. ... (*D&O* at 50)

and in directing the Hawaiian Electric Companies

> to adopt standards that establish when additional renewable energy can or cannot be added on an island or region therein without markedly increasing curtailment, either for existing or new renewable projects. FIT generation should meet new load requirements and **displace fossil fuel generation** ... " [emphasis added] (*D&O* at 50-51):

the Commission implicitly acknowledged that the initial 5% system cap was based on a guess, and deferred, until the "Reliability Standard" phase of the proceeding, the determination of a proper cap on the amount of as-available renewable energy that the utility should be obliged to purchase under a FIT.

To give effect to the Commission's directions at pp. 50-51 of the *D&O*, as those directions relate to the determination of a proper cap on the amount of as-available renewable energy that the utility should be obliged to purchase under a FIT, Clean Energy Maui LLC ("CEM") and Zero Emissions Leasing LLC ("ZEL") proposed a "Reliability Standard for Curtailment," shown at Attachment B hereto. The purpose of

the CEM/ZEL Reliability Standard for Curtailment is to specify a cap on the amount of as-available renewable energy that the utility ***should*** be obliged to purchase under a FIT, based on the utility's answer to Question 1, *i.e.*, how much as-available renewable energy ***could*** be added to the grid of each island without compromising electric system reliability based on the regulating capacity of the utility's must-run and dispatchable non-renewable generation, taking into account any displacement of the utility's dispatchable non-renewable generation by the added as-available renewable energy generation.

To "fill-in-the-blanks" of the CEM/ZEL Reliability Standard for Curtailment, and find out how much as-available renewable energy ***could*** be added to the grid of each island without compromising electric system reliability based on the regulating capacity of the utility's must-run and dispatchable non-renewable generation, taking into account any displacement of the utility's dispatchable non-renewable generation by the added as-available renewable energy generation, Zero Emissions submitted ZE-IR-107, shown at Attachment C hereto, to the Hawaiian Electric Companies.

As with PUC-IR-1, the Hawaiian Electric Companies declined, in their responses to ZE-IR-107, to define how much renewable energy each island could incorporate. The HECO and the HELCO responses to ZE-IR-107(c) contain no kilowatt-hour figures at all. The MECO response to ZE-IR-107(c) contains no kilowatt-hour figures for potential curtailment of non-renewable energy generating facilities, and contains no kilowatt-hour figures for actual curtailment of renewable or non-renewable energy generating facilities. The Hawaiian Electric Companies' responses to ZE-IR-107(d) contain no kilowatt-hour figures at all. This will not do.

The Hawaiian Electric Companies' excuses for not providing the requested kilowatt-hour figures do not wash. The Hawaiian Electric Companies know or can reasonably estimate the kilowatt-hours of reduced generation from their dispatchable non-renewable generation when they cycle that generation up and down during a typical 24-hour load cycle. The Hawaiian Electric Companies know or can reasonably estimate how many kilowatt-hours they currently are receiving from as-available renewable generation during a typical 24-hour load cycle, how many hours that as-available renewable generation is being curtailed during a typical 24-hour load cycle, and how many kilowatt-hours of electricity from as-available renewable generation are currently being curtailed during a typical 24-hour load cycle. The Hawaiian Electric Companies know or can reasonably estimate capacity factors of as-available renewable energy generation for displacing dispatchable non-renewable generation with as-available renewable generation. The Hawaiian Electric Companies know the regulating capacity of their must-run and dispatchable non-renewable generation. The Hawaiian Electric Companies can reasonably estimate how much as-available renewable energy ***could*** be added to the grid of each island without compromising electric system reliability based on the regulating capacity of the utility's must-run and dispatchable non-renewable generation, taking into account any displacement of the utility's dispatchable non-renewable generation by the added as-available renewable energy generation.

Zero Emissions believes that the Hawaiian Electric Companies do not want to answer ZE-IR-107(c) and (d) because they do not want to admit that there is a positive, substantial and reasonably ascertainable amount of as-available renewable energy that ***could*** be added to the grid of each island without compromising electric system reliability

based on the regulating capacity of the utility's must-run and dispatchable non-renewable generation, taking into account any displacement of the utility's dispatchable non-renewable generation by the added as-available renewable energy generation.

Instead of answering Question 1 (as put to the Hawaiian Electric Companies in the form of ZE-IR-107), the Hawaiian Electric Companies have proposed creation of a "Reliability Standards Working Group," akin and redundant to the utilities' Integrated Resource Planning processes, in which the FIT docket intervenors would have no procedural rights to obtain answers to Question 1 from the Hawaiian Electric Companies, and in which the Hawaiian Electric Companies would never have to answer Question 1. Zero Emissions views the Reliability Standards Working Group proposal as a stratagem to avoid answering Question 1.

An answer to Question 1 (as put to the Hawaiian Electric Companies in the form of ZE-IR-107) is needed as a first step to determining how much as-available renewable energy the utilities ***should*** be obliged to purchase under a FIT.

An answer to Question 1 (as put to the Hawaiian Electric Companies in the form of ZE-IR-107) is also needed to determine the truth of the assumptions underlying the following assertions, contained in Attachment 4 to the *HECO Companies Report on Reliability Standards* (*"HECO RS Att. 4"*):

> There is a potential reliability risk operating near minimum output on dispatchable units. The minimum dispatchable output for each dispatchable unit is determined by the lowest level of stable operation on the generating unit. Operating below this level can result in the unit tripping offline or cause deviations from environmental permit requirements. When all units are near the minimum output, the system is vulnerable to failure for loss-of-load events. The ability of the units to back down for high frequency excursions is limited and the units may be driven offline. The present regulating reserve down requirement has been set at the minimum regulating reserve down for the single contingency loss of load during minimum load (off-peak) conditions. Loss of more than this

> amount (6 MW on the MECO system, 9 MW on the HELCO system) can drive the responsive units (through their droop response) to below their stable operating point and risk loss of the units, or prolonged high-frequency excursions which may cause trips of other generation and cascading outages. The potential loss of load is larger during daytime conditions ... (*HECO RS Att. 4* at 6)
>
> ...during high variable output, in the absence of significant load growth the HELCO system cannot accommodate all future and existing RE even if all dispatchable conventional generation operates nearly twenty four hours at near minimum output. As mentioned above, operating in that manner ... may not be prudent due to potential reliability implications. (*HECO RS Att. 4* at 8)
>
> ... Similar to HELCO, absent significant load growth, MECO cannot accommodate all the existing or future renewable generation even with conventional generation backed down to minimum (plus down reserve) 24 hours a day. (*HECO RS Att. 4* at 9).
>
> The HELCO system will operate under extended periods with a minimal amount of dispatchable generation online. This will have an effect on ... the response capabilities for frequency control. MECO has similar concerns and must make additional decisions regarding minimum conventional generation, to cover for variability, as unlike HELCO the renewable energy additions are all variable. (*HECO RS Att. 4* at 16)

The Hawaiian Electric Companies make these assertions of compromised electric system reliability to justify their proposals, in the *HECO Companies Report on Reliability Standards*, to effectively establish caps of 0 MW on the islands of Hawaii, Maui, Molokai and Lanai for the amounts of as-available renewable generation that the utilities might be obliged to purchase under a FIT. Zero Emissions believes that each of the utilities' assertions falsely and misleadingly assumes or implies that the utility would choose or be obliged to reduce the utility's entire dispatchable non-renewable generation to its "minimum" level, and thus minimize the regulating capacity available from such dispatchable non-renewable generation, at the same time that as-available renewable energy is added to the grid. Zero Emissions believes that a truthful answer to Question 1 (as put to the Hawaiian Electric Companies in the form of ZE-IR-107) would show that

there is some amount of as-available renewable energy that could be added to the grid of each island, and some amount of dispatchable non-renewable energy that could be displaced by such added as-available renewable energy, without compromising electric system reliability.

III. RELIEF REQUESTED

Accordingly, Zero Emissions respectfully requests that, for the aforementioned reasons, the Commission:

(1) Direct the Hawaiian Electric Companies to provide responsive answers to to subsections (c) and (d) of Zero Emissions' Information Request ZE-IR-107 to the Hawaiian Electric Companies; and

(2) Such further relief as the Commission deems appropriate.

Zero Emissions requests a hearing on its motion.

* * * *

DATED: Honolulu, Hawaii, March 8, 2010

Erik Kvam
Chief Executive Officer
Zero Emissions Leasing LLC

Darcy L. Endo-Omoto
Vice President
Government & Community Affairs

March 18, 2009

FILED
2009 MAR 18 P 4:22
PUBLIC UTILITIES
COMMISSION

The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
Kekuanaoa Building, First Floor
465 South King Street
Honolulu, Hawaii 96813

Dear Commissioners:

Subject: Docket No. 2008-0273
HECO Companies' Responses to the Commission's Information Requests

The Commission submitted Information Requests ("IRs") prepared by the Commission's consultant, the National Regulatory Research Institute, by letter dated March 2, 2009 in the subject proceeding.

Enclosed are the Hawaiian Electric Companies' responses to PUC IRs 1 to 3, 5 to 31, and 33 to 35.[1] Responses to the remaining IRs will be submitted to the Commission shortly.

Sincerely,

Enclosures

cc: Service List

[1] The "Hawaiian Electric Companies" are Hawaiian Electric Company, Inc., Hawaii Electric Light Company, Inc., and Maui Electric Company, Limited.

Attachment A

PUC-IR-1

For each island, with the current levels of demand, transmission, and supply resources, what is the maximum amount of total and additional intermittent resources that can be accommodated without compromising reliability?

Response:

The attributes of variable generation that impact the reliability of the power system are:

- Variability : the amount of change according to the availability of the primary energy source (wind, sunlight and water motion) resulting in increased fluctuations in the plant output on all time scales
- Uncertainty: the ability to forecast the magnitude and timing of variable generation

Reliable system operation requires balancing of supply and demand at every moment in time, in accordance with prevailing operating criteria. The measure of successful power balancing on the Hawaii power systems is the system frequency. There is a certain amount of variability and uncertainty in system demand and to a lesser extent with conventional generation. However, large scale integration of variable (intermittent) generation significantly alters familiar patterns for the system. Even for larger plants which can have enhanced control features (such as ramp control, or curtailment control) the variable resources are not fully dispatchable, and therefore require use of other controllable or dispatchable resources to balance the supply and demand. Thus, as intermittent, variable generation adds to the power imbalance, there can be a corresponding impact on reliability through the increased balancing error that will result from the addition. The practical question is the degree to which reliability has become affected, and what amount of reliability impact is acceptable in order to accommodate the additional intermittent

resources. In addition to creating imbalances on the power system, if operational practices allow the variable generation to displace dispatchable generators from the system, complications increase due to the loss of the response capabilities from the dispatchable generator.

In summary, the amount of variable generation that can be accepted on a power system will depend on various factors such as:

- the characteristics of the variable generation such as rate of change, correlation with other resources, degree of possible change in a given time period, predictability of output, control capabilities, etc.
- the characteristics of the other controllable or dispatchable resources on the system such as available ramp rate, frequency response, minimum load, startup time, etc.
- the minimum number of conventional generators which are necessary to provide reliability operation of the power system: as necessary to survive reasonably probable faults and disturbances, ability to regulate voltages, perform load balancing and frequency control
- operational configuration to mitigate reliability impacts and their costs, for example, the inclusion of increased reserves (minimizing displacement of dispatchable units)
- evaluation of possible technical solutions and their costs such as supplemental controls on the variable generation, modification of the dispatchable generation, infrastructure modifications
- Establishing minimum reliability criteria to be maintained on the power system

Therefore, for each of the HECO Companies' island systems, there is no single, set maximum

amount of total (and additions over current) levels of intermittent resources that can be accommodated without compromising reliability. Rather, resource planning should focus on identifying the means to reduce the impact to reliability with the addition of a high percentage of intermittent generation on an island system. In order to minimize the impact, utility engineers and planners along with owners and developers of intermittent generation must focus on minimizing the variability in output from these generators and minimize the unpredictability in output from these generators. If variability and unpredictability can be reduced, then all other things being equal, an island system should be able to reduce the impact to reliability with a certain amount of intermittent generation (or possibly increase the amount of intermittent generation while minimizing the reliability reduction created).

FILED
2008 FEB -4 P 2:02
PUBLIC UTILITIES COMMISSION

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

In the Matter of	)	
	)	
PUBLIC UTILITIES COMMISSION	)	DOCKET NO. 2008-0273
	)	
Instituting a Proceeding to Investigate the Implementation of Feed-in Tariffs	)	
	)	

PROPOSED RELIABILITY STANDARDS OF CLEAN ENERGY MAUI LLC AND ZERO EMISSIONS LEASING LLC

CLEAN ENERGY MAUI LLC ("Clean Energy Maui") and ZERO EMISSIONS LEASING LLC ("Zero Emissions") respectfully submit the following proposed Reliability Standards, contained in *Appendix III – Renewable Energy Generating Facility Reliability Standards* to Clean Energy Maui's and Zero Emissions' proposed *Schedule FIT: Feed-in Tariff -- Purchases from Renewable Energy Generators* for each of Hawaiian Electric Company, Inc. ("HECO"), Hawaii Electric Light Company, Inc. and Maui Electric Company, Limited (the "HECO Companies"), in the above-referenced proceeding.

Clean Energy Maui's and Zero Emissions' proposed Reliability Standards have two parts. The first part is Technical Requirements for Interconnection. The Technical Requirements for Interconnection are essentially identical to the technical requirements for interconnection contained in Rule No. 14H of Hawaiian Electric Company, Inc. This is consistent with the Commission's direction at page 50 in its *Decision and Order*, filed

Attachment B

APPENDIX III

Renewable Energy Generating Facility Reliability Standards

Technical Requirements for Interconnection

Objectives of Good Interconnection Practice

- **Safety** – To protect the safety of utility personnel, utility customers, and the public.
- **Reliability** – To maintain the reliability of the utility system for all utility customers.
- **Power Quality** – To provide for acceptable power quality[1] and voltage regulation on the utility system and for all utility customers.
- **Restoration** – To facilitate restoration of power on the utility system.
- **Protect Utility and Customer Equipment** – To protect utility and customer equipment during steady state and faulted system operating conditions.
- **Protect Generating Facilities** – To protect generating facilities from operation of utility protective and voltage regulation equipment.
- **Utility System Overcurrent Devices** – To maintain proper operation of the utility system's overcurrent protection equipment.
- **Utility System Operating Efficiency** – To ensure operation at appropriate power factors and minimize system losses.

[1] "Acceptable" power quality is power delivered to customers that does not impair operation of the customers' equipment or cause visible light flickering due to voltage fluctuations under normal operating conditions. One element of power quality is voltage flicker, which is a function of the magnitude of voltage fluctuation and the frequency at which the fluctuation occurs. Voltage flicker is described in Section 4.n. of this Appendix III.

APPENDIX III

Renewable Energy Generating Facility Reliability Standards

Reliability Standard for Curtailment

The Company has determined that generation and/or delivery of the following amounts of energy ("Curtailment Amounts") otherwise generated by or deliverable from the following generating facilities that do not generate Renewable Energy from a Renewable Energy Source ("Non-Renewable Energy Generating Facilities") may be curtailed, in the following order, to accommodate the delivery, to the Company's electric system, of the following amounts of Renewable Energy ("Renewable Energy Amounts") generated by Renewable Energy Generating Facilities of the following types, without impairing the reliable operation of the Company's electric system, provided that said Renewable Energy Generating Facilities comply with the Technical Requirements for Interconnection set forth in this Appendix III:

Non-Renewable Energy Generating Facility	Curtailment Amounts (kWh)	Type of Renewable Energy Generating Facility	Renewable Energy Amounts (kWh)
[identify curtailable Non-Renewable Energy Generating Facility no. 1]	[to be determined]	Photovoltaic Concentrating Solar Onshore Wind In-line Hydro	[to be determined] [to be determined] [to be determined] [to be determined]
[identify curtailable Non-Renewable Energy Generating Facility no. 2]	[to be determined]	Photovoltaic Concentrating Solar Onshore Wind In-line Hydro	[to be determined] [to be determined] [to be determined] [to be determined]
[identify curtailable Non-Renewable Energy Generating Facility no. 3]	[to be determined]	Photovoltaic Concentrating Solar Onshore Wind In-line Hydro	[to be determined] [to be determined] [to be determined] [to be determined]
[et cetera]			

Dean K. Matsuura
Manager
Regulatory Affairs

March 1, 2010

FILED
2010 MAR -1 P 4:25
PUBLIC UTILITIES COMMISSION

The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
Kekuanaoa Building, First Floor
465 South King Street
Honolulu, Hawaii 96813

Dear Commissioners:

Subject: Docket No. 2008-0273 – Feed-in Tariff Investigation
Hawaiian Electric Companies' Responses to Information Requests

Attached are the Hawaiian Electric Companies'[1] responses to the information requests on Reliability Standards and Queuing and Interconnection Procedures, submitted by the following parties on February 16, 2010:

- Blue Planet Foundation;
- Division of Consumer Advocacy;
- The Department of Business, Economic Development, and Tourism;
- Hawaii Renewable Energy Alliance;
- The Solar Alliance and Hawaii Solar Energy Association;
- Tawhiri; and
- Zero Emissions Leasing LLC.[2]

Sincerely,

Attachments

cc: Service List

[1] Hawaiian Electric Company, Inc., Hawaii Electric Light Company, Inc., and Maui Electric Company, Limited are collectively referred to as the "Hawaiian Electric Companies."
[2] Information requests were submitted on February 11, 2010.

Attachment C

Response to

Zero Emissions Leasing LLC's

Information Requests

ZE-IR-107

For each utility electric system on the islands of Oahu, Hawaii, Maui, Molokai and Lanai:

a. Identify, by name, generation type and generating capacity, all generating facilities from which the delivery of electricity to the utility electric system can be reduced or curtailed by the utility during a 24 hour period.

b. Please state the order in which delivery of electricity from the generating facilities identified in your response to part a. can be or is reduced or curtailed by the utility during a 24 hour period;

c. For each of the generating facilities identified in your response to part a. please state:

   1. the amount in kilowatt-hours of electricity, by which deliveries of electricity from that generating facility to the utility electric system can be reduced or curtailed by the utility during a 24-hour period; and

   2. the amount, in kilowatt-hours of electricity, by which deliveries of electricity from that generating facility to the utility electric system are being reduced or curtailed during a 24-hour period.

d. For each of the generating facilities identified in your response to part a. that does not generate electricity from hydropower, solar radiation, wind, geothermal, biogas, or biomass (a "non-renewable generating facility"), please state how much electricity generation, in kilowatt-hours of electricity from the following types of generating facilities:

   1. in-line hydropower generating facilities

   2. photovoltaic generating facilities

   3. concentrating solar generating facilities or

   4. onshore wind generating facilities

   considering each such type in the aggregate could be added or delivered to utility electric system, without compromising the reliability of the utility electric system, by displacing, reducing or curtailing electricity generation from such non-renewable generating facility.

HECO Response:

a. For Oahu, please refer to the table on pages 5 and 6 of this response. The table identifies by name, generation type and generating capacity those generating facilities, utility and non-

utility, that deliver electricity to the Hawaiian Electric Company, Inc. ("HECO"), grid on Oahu.

All of the HECO-owned units, except for the Distributed Generation ("DG") sets, are subject to dispatch control by HECO, where their outputs can be controlled from moment-to-moment. Those HECO-owned units that are designated as peaking or cycling duty, except for the DG sets, may be turned on and off daily, depending on system demand. The DG sets are ramped up to full load when they are turned on. These small units are not operated at part loads.

The HECO-owned units that are designated as baseload duty operate 24 hours a day and are subject to dispatch control by HECO. Their outputs can vary, depending on system demand, and the outputs at which the units operate are determined through economic dispatch by HECO's Energy Management System ("EMS"). Their outputs can be reduced to their operating minimum ratings, but the units are not turned off, except for planned or forced outages. Typically, during light loading conditions, the baseload units are operated somewhat above their operating minimum ratings to allow for potential situations where load may be suddenly lost from the system and the generating units must reduce their outputs to maintain the balance between supply and demand.

The AES Hawaii and Kalaeloa Partners, L.P. units are non-utility firm capacity units that operate in baseload duty (i.e., 24 hours a day). These units are subject to economic dispatch control by HECO's EMS. The outputs of these facilities can be reduced to achieve economic allocation of load among all operating units, but their outputs cannot be reduced below their contract minimum ratings.

The City and County H-Power waste-to-energy facility provides 46 MW of firm power

during weekday on-peak periods (7 am to 9 pm), where, in general, it provides 46 MW to the HECO grid during weekday on-peak periods, 40 MW (or more, if there are no system constraints, such as light loading) during weekday off-peak (9 pm to 7 am) December through May periods, and 25 MW (or more, if there are no system constraints, such as light loading) during the weekend and holiday off-peak December through May periods. HECO cannot reduce or curtail the output of this facility below these levels, unless there are conditions/constraints, such as light loading or a transmission line outage. For the other periods, there are no specified amounts of power that HECO must take from H-POWER.

HECO also purchases energy from two non-utility, non-firm power producers on an as-available basis. HECO has a contractual obligation to accept the energy made available by these two facilities. Therefore, HECO cannot reduce or curtail the outputs of these facilities, unless there are system constraints, such as light loading or a transmission line outage.

b. The order in which generation at each facility is reduced by the utility is determined by economic dispatch so that the units with the largest incremental cost is reduced first with other units following in sequence until such time that the output of the generating units match the load at that time and the required spinning reserves are met. Currently, the mix of generating units include HECO's generators at the Kahe, Waiau, and Honolulu Power Plants and the independent power producers, AES, Kalaeloa and H-Power. The AES, Kalaeloa, and H-Power units are base loaded, therefore they are must run units. The Kahe units 1 to 6 and Waiau 7 and 8 are also base load units and these are additional must run units. The amount of output that these units can be reduced is based on several factors including but not limited to, the system load, generating units on maintenance, forced outage conditions

and temporary derates of generating units. Other as available resources such as net energy metering photovoltaic units that are not under HECO dispatch will impact the amount of load to be served. Because there may be several different combinations of these factors and as these conditions change HECO is not able to provide the amounts by which energy can be curtailed during a 24 hour period.

c. See response to subpart b above.

d. See response to subpart b above.

Hawaiian Electric Company, Inc. Firm Capacity Generating Units					
Unit	Type	Duty	Fuel Type	Operating Minimum MW-Net	Normal Top Load MW-Net
Honolulu 8	Steam	Cycling	LSFO	22	53
Honolulu 9	Steam	Cycling	LSFO	22	54
Kahe 1	Steam	Baseload	LSFO	33	82
Kahe 2	Steam	Baseload	LSFO	33	82
Kahe 3	Steam	Baseload	LSFO	32	86
Kahe 4	Steam	Baseload	LSFO	32	85
Kahe 5	Steam	Baseload	LSFO	51	134
Kahe 6	Steam	Baseload	LSFO	50	134
Waiau 3	Steam	Cycling	LSFO	22	47
Waiau 4	Steam	Cycling	LSFO	22	47
Waiau 5	Steam	Cycling	LSFO	23	55
Waiau 6	Steam	Cycling	LSFO	23	54
Waiau 7	Steam	Baseload	LSFO	33	83
Waiau 8	Steam	Baseload	LSFO	33	86
Waiau 9	Combustion Turbine	Peaking	Diesel	6	53
Waiau 10	Combustion Turbine	Peaking	Diesel	6	50
CIP CT-1	Combustion Turbine	Peaking	Biodiesel	39	113
DG Set 1	Diesel Engines	Peaking	Diesel		10
DG Set 2	Diesel Engines	Peaking	Diesel		10
DG Set 3	Diesel Engines	Peaking	Diesel		10
				Total HECO-Owned Firm Capacity	1,328

Oahu Non-Utility Firm Capacity Generating Units					
Unit	Type	Duty	Fuel Type	Contract Minimum MW-Net	Contract Maximum MW-Net
AES Hawaii	Steam	Baseload	Coal	63	180
Kalaeloa Partners, L.P.	Steam	Baseload	LSFO	65	208
H-Power	RDF-Fired Steam	Baseload	Refuse Derived Fuel	25	46
				Total Non-Utility Firm Capacity	434

Non-Utility Non-Firm (As-Available) Generating Units					
Unit	Type	Duty	Fuel Type	Contract Minimum MW-Net	Contract Maximum MW-Net
Chevron U.S.A.	Combustion Turbine	As-Available	Refinery Gas / Naphtha	--	9.6
Tesoro Hawaii Corporation	Combustion Turbine	As-Available	Refinery Gas / Naphtha	--	18.5
				Total Utility Non-Firm Nameplate	28.1

Notes:

1. LSFO = Low Sulfur Fuel Oil.
2. Baseload duty means the unit runs 24 hours a day. The unit may follow load.
3. Cycling duty means the unit is turned on in the morning and turned off in the evening. The unit may also follow load.
4. Peaking duty means that the unit is turned on in the late afternoon to serve the evening peak and is turned off thereafter. The unit may also be turned on to provide spinning reserve.
5. Firm capacity means that the unit can provide a specific amount of power (in MW) at specific times to meet system needs.
6. Non-firm or as-available generation means the utility cannot rely on a specific amount of power at specific times to meet system needs. In general, the utility has an obligation to accept as-available energy that is made available by as-available energy producers.

ZE-IR-107

For each utility electric system on the islands of Oahu, Hawaii, Maui, Molokai and Lanai:

(a) identify, by name, generation type and generating capacity, all generating facilities from which the delivery of electricity to the utility electric system can be reduced or curtailed by the utility during a 24-hour period;

(b) please state the order in which delivery of electricity from the generating facilities identified in you response to part (a) can be or is reduced or curtailed by the utility during a 24-hour period;

(c) for each of the generating facilities identified in your response to part (a), please state:
  (i) the amount, in kilowatt-hours of electricity, by which deliveries of electricity from that generating facility to the utility electric system can be reduced or curtailed by the utility during a 24-hour period; and
  (ii) the amount, in kilowatt-hours of electricity, by which deliveries of electricity from that generating facility to the utility electric system are currently being reduced or curtailed during a 24-hour period.

(d) for each of the generating facilities identified in your response to part (a) that does not generate electricity from hydropower, solar radiation, wind, geothermal, biogas, or biomass (a "non-renewable generating facility"), please state how much electricity generation, in kilowatt-hours of electricity, from the following types of generating facilities:
  (i) in-line hydropower generating facilities
  (ii) photovoltaic generating facilities
  (iii) concentrating solar generating facilities, or
  (iv) onshore wind generating facilities

Considering each such type in the aggregate, could be added or delivered to the utility electric system, without compromising the reliability of the utility electric system, by displacing reducing or curtailing electricity generation from such nonrenewable generating facility,

HELCO Response:

(a) On the HELCO system, delivery of electricity to the system at all generating facilities can be reduced or curtailed by the utility (in some cases, curtailment or reduction requires disconnection as there is no means for incremental load reduction). This is necessary to ensure reliable operation of the power system. Nearly all of the generator resources on the transmission system are dispatchable, and can be curtailed (through dispatch or a curtailment signal) or reduced (or stopped) by the system operator through the

SCADA/EMS system (for a discussion on HELCO's Must-Run generation see part b below). We will [or have requested] be requesting that the geothermal facility and Wailuku River Hydro are curtailed through operator instruction although we are requesting remote dispatch of these facilities to be added in the future. The majority of small distributed generators cannot be remotely monitored and controlled. For those resources, disconnection occurs manually at the generator location and these resources are disconnected only during restoration or maintenance activities. If the question is meant to address the types of generation which is subject to curtailment for excess energy on the HELCO system, the categories are as described on page 1 of Attachment 4 (Must-take Units). The units in this categroy include the following at this time:

1. Puna Geothermal Venture 30 MW.
2. Apollo (Tawhiri) 20.5 MW
3. Hawi Renewable Development – 10.56 MW
4. Wailuku River Hydro – 12.1 MW
5. Lalamilo – 2.2 MW
6. Puueo Hydro – 3 MW
7. Waiau Hydro – 1.1 MW
8. Sopogy (CSP)

Which facilities are curtailed will be dependent upon operating conditions such as system demand, production from various suppliers, derations, maintenance outages, etc. The first two suppliers are often curtailed off-peak under high variable production scenarios and under normal unit availability.

(b) It is assumed this question is with regard to excess energy curtailments as curtailments for other reasons are not subject to an order of curtailment. The principles by which must-take energy is curtailed are described in detail in Attachment 4 of the Companies'

Reliability Standards. Must run dispatchable generation is brought to minimum dispatchable load, with consideration for down-reserves, prior to curtailment of any resources. The generation considered must-run can change for future installations and for operating conditions.

Below is the operational curtailment policy instruction as of today, for HELCO's System Operators for excess energy curtailments. It does not include SOPOGY; that facility comes online only after calling the system operator as the remote curtailment interface is not yet completed. Note that this reference is specific to today's dispatch. For future generation additions, the mix of must-run generation and curtailable resources may change.

Normally during system off-peak periods, HELCO reduces the output of HELCO units and dispatchable Independent Power Producer units, prior to curtailing the as-available output. All cycling units are first taken off-line. Base load units are operated near their minimum regulating load limits (LFCMIN) so that the downward regulating reserve is not less than 9 MW. The AGC Regulating reserve alarm limit is 6 MW. For HELCO's typical dispatch, to determine excess energy curtailment, it is assumed the following dispatchable units are online and participating in regulation normally:

1. Hamakua Energy Partners which may be in dual train (2 CT CC) or single train (1 CT CC) depending on the near-term energy needs. The facility will be taken to 1 CT CC providing there will be sufficient down-time to account for the time it takes for HEP to shut down and start up, and considering the volatility of as-available energy, and the permit/contract limits on number of startups per day/month. In 2 CT CC the minimum under AGC is 18.5 MW, in 1 CT CC the minimum is 9 MW.
2. Hill 6 – Low limit on AGC (LFCMN) 15 MW
3. Hill 5 - Low limit on AGC (LFCMN) 8 MW

4. Puna Steam – Low limit on AGC (LFCMN) 6 MW

5. Keahole Combined Cycle - which may be in dual train (2 CT CC) or single train (1 CT CC) depending on the near-term energy needs. The facility will be taken to 1 CT CC providing there will be sufficient down-time to account for the time it takes for the second train to shut down and start up, and considering the volatility of as-available energy and permit limitations on numbers of startups. In 2 CT CC the minimum under AGC is 16 MW, in 1 CT CC the minimum is 7 MW (LFCMN).

In addition to these off-peak must-run units, PGV is operated 24 hours with a minimum take of 27 off-peak, and 30 on-peak, if PGV can produce it, unless curtailments are in effect. (See below for how PGV fits into curtailment priorities). Shipman is operated as must-run for certain scheduled shifts, and Keahole is dispatched according to the minimum generation required for the given load, beginning at 130 MW, as required to alleviate possible excessive overload of the 6800 line.

The Regulating Reserve Down (Reg Rv Dn) that is on the Generation Unit Status display or the Generation Area Status display is used to determine when to start the curtailment. This means that the units on-line will be above their minimum regulation limit (LFCMIN). The as-available that will be curtailed to maintain the Regulating Reserve Down (Reg Rv Dn) is no less than 9 MW. The curtailment order from first to last curtailed are:

1. Puna Geothermal Venture – Brought to normal schedule prior to curtailment. This is a curtailment of up to 3 MW (from 30 MW to 27 MW) during off-peak hours (10 pm to 7 am); schedule on-peak is 30 MW and PGV should be no higher than 30 prior to curtailment.

2. Apollo second phase (This is the Group B control) – Capacity of the facility is 20.5, but the amount of capacity in group B 13.5 MW. For group B curtailment, the reduction may begin at 20.5 MW to as low as 7.0 MW (the capacity of Group A) as needed.

3. Hawi Renewable Development – 10.56 MW capacity. This may be curtailed down to zero as needed.
4. Puna Geothermal Venture – The 5 MW above 22 MW is treated as as-available energy. If excess energy remains after curtailing 1-3, curtail this 5 MW (reduce PGV from 27 MW to 22 MW)

5. Wailuku River Hydro – 12.1 MW capacity. Wailuku may be curtailed for excess energy if steps 1-4 are insufficient. There is no remote control capability. The operator must be contacted, and in advance if possible. If the operator cannot be reached and curtailment is necessary, the tie breaker may be opened.

6. Apollo first phase (This is the Group A control) – 7 MW, which may be curtailed down to zero.

7. Lalamilo – 2.2 MW - there is no remote curtailment priority. It is unlikely the excess energy will require remote curtailment beyond 1-6.

8. Puueo Hydro – 3 MW - there is no remote curtailment priority. It is unlikely the excess energy will require remote curtailment beyond 1-6.

9. Waiau Hydro – 1.1 MW - there is no remote curtailment priority. It is unlikely the excess energy will require remote curtailment beyond 1-6.

Again, the Regulating reserve down is used to determine when to do the curtailment and when to release it. As load increases, the order is reversed and the units are picked up in sequence.

HELCO's non-typical dispatch. There will be times when HELCO might have to deviate from the typical dispatch shown above. As mentioned, at times there is not enough time to take combined cycle facilities from 2CTCC to 1CTCC. In the event that there are two base-load steam units offline (say, Hill 6 and Puna) we will operate Shipman in its place. Under some conditions, we may need to operate CT off-peak to provide a third unit for frequency regulation under AGC control. In such cases, where a unit is necessary for operational reasons, those units become "must-run", and the

minimum load of the must-run units will be respected off-peak (along with 9 MW regulating reserve down) and the unit will not be taken offline.

(c)

i. See response to subpart b above.

ii. HELCO has no record of curtailed energy. This would require estimates of available energy to be provided by the supplier. Curtailments routinely occur at this time during off-peak conditions, from the top of the curtailment order through the Wailuku facility.

(d) If the identified facilities are variable and/or connecting to the distribution system, then an analysis would need to be done to assess the impact of these facilities, and requirements and/or measures defined so that the connection of such facilities would not contribute to the reliability issues from distributed and variable generation discussed in Attachments 2 and 3 of the Companies' Reliability Standards.

ZE-IR-107

For each utility electric system on the islands of Oahu, Hawaii, Maui, Molokai and Lanai:

(a) identify, by name, generation type and generating capacity, all generating facilities from which the delivery of electricity to the utility electric system can be reduced or curtailed by the utility during a 24-hour period;

(b) please state the order in which delivery of electricity from the generating facilities identified in your response to part (a) can be or is reduced or curtailed by the utility during a 24-hour period;

(c) for each of the generating facilities identified in your response to part (a), please state:

(i) the amount, in kilowatt-hours of electricity, by which deliveries of electricity from that generating facility to the utility electric system can be reduced or curtailed by the utility during a 24-hour period; and

(ii) the amount, in kilowatt-hours of electricity, by which deliveries of electricity from that generating facility to the utility electric system are currently being reduced or curtailed during a 24-hour period.

(d) for each of the generating facilities identified in your response to part (a) that does not generate electricity from hydropower, solar radiation, wind, geothermal, biogas, biomass (a "non-renewable generating facility"), please state how much electricity generation, in kilowatt-hours of electricity, from the following types of generating facilities:

(i) in-line hydropower generating facilities

(ii) photovoltaic generating facilities

(iii)concentrated solar generating facilities, or

(iv)onshore wind generating facilities

considering each such type in the aggregate, could be added or delivered to the utility electric system, with out compromising the reliability of the electric system, by displacing, reducing or curtailing electricity generation from such non-renewable generating facility.

MECO Response:

(a)

Generating Facility	Generation Type	Generation Nominal Capacity (MW)
Maui		
Kahului Power Plant	Steam	34
Maalaea Power Plant	Diesel and Combustion Turbines with Heat Recovery	212.1
Hana Substation DG	Diesel	2
Kaheawa Wind Farm	Wind	30
Makila Hydro	Hydro	0.5
Molokai		
Palaau Power Plant	Diesel	15.2
Lanai		
Miki Basin Power Plant	Diesel	10.4
La Ola PV Farm	Photovoltaic	1.2
Manele CHP	Diesel	0.8

(b) The order in which delivery of electricity from the generating facilities on Maui that can be or are reduced or curtailed by the utility during a 24-hour period for excess energy conditions is as follows:

1. Maalaea Power Plant (must run units down to minimum plus reserves)
2. Kahului Power Plant (must run units down to minimum)
3. Makila Hydro
4. Kaheawa Wind Farm

The distributed generators located in the Hana Substation are run only during emergencies or periods of maintenance on the Hana 23kV transmission line. HC&S is dispatched consistent with their PPA.

For Molokai, Palaau Power Plant is the only generating facility which delivery of electricity can be reduced by the utility (must run units down to minimum plus reserves) during a 24-hour period.

The order in which delivery of electricity from the generating facilities on Lanai that can be or is reduced or curtailed by the utility during a 24-hour period for excess energy conditions is as follows:

1. Miki Basin Power Plant (must run units down to minimum plus reserves)
2. La Ola Photovoltaic Farm
3. Manele CHP (can be reduced by 100kW during low load periods)

(c)

Generating Facility	Amount of Electricity that can be potentially Curtailed or Reduced in a 24-Hour Period (KWH)*	Amount of Electricity currently being Curtailed or Reduced in a 24-Hour Period (KWH)*
Maui		
Kahului Power Plant	Varies - Dependent upon system load, available units and regulating reserve requirements	Varies - Dependent upon system load, available units and regulating reserve requirements
Maalaea Power Plant	Varies - Dependent upon system load, available units and regulating reserve requirements	Varies - Dependent upon system load, available units and regulating reserve requirements
Hana Substation DG	Units not typically online	Units not typically online
Kaheawa Wind Farm	720,000	Varies - Dependent upon system load and power output from as-available units
Makila Hydro	12,000	Varies - Dependent upon system load and power output from as-available units
Molokai		

Palaau Power Plant	Varies – Dependent upon system load, available units and regulating reserve requirements	Varies - Dependent upon system load, available units and regulating reserve requirements
Lanai		
Miki Basin Power Plant	Varies - Dependent upon system load, available units and regulating reserve requirements	Varies - Dependent upon system load, available units and regulating reserve requirements
La Ola PV Farm	7,200**	Varies - Dependent upon system load and power output from as-available units
Manele CHP	800***	Varies - Dependent upon system load and power output from as-available units

* Based on Generation Nominal Capacity. Actual numbers will vary based on resource availability for as-available generation. Numbers shown are maximum values. MECO has not record of the amount of kWhs that have been or are curtailed from a facility.
** Based on 6 hours of solar radiation at full output in a 24-hour period
*** Based on reducing CHP by 100kW for 8 hours during low load periods (night time) but any curtailments will reduce the potential savings from the waste heat recovery.

(d) The amount of electricity generated, in kilowatt-hours of electricity, from the various types of renewable generating facilities that could be added or delivered to the utility electric system by displacing, reducing or curtailing electricity generation from such non-renewable generating facility is difficult to state due to the dynamic nature of an electrical system and the numerous combinations of factors that can influence the ability of an electrical system to integrate renewable generation without compromising the reliability of the electric system.

Variables that can affect the ability of an electrical system to integrate renewable generation without compromising the reliability of the electric system include:

1. System load
2. Types of firm generation available
3. Regulating reserve requirements
4. Level of power output from as-available generation
5. Volatility of as-available renewable generation on-line

Currently, it is already MECO's practice to lower the non renewable facilities to their minimums (respecting contractual provisions) prior to curtailing the as-available facilities.

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

In the Matter of	)	
	)	
PUBLIC UTILITIES COMMISSION	)	DOCKET NO. 2008-0273
	)	
Instituting a Proceeding to Investigate the Implementation of Feed-in Tariffs	)	**NOTICE OF HEARING**
	)	
	)	

NOTICE OF HEARING OF MOTION

TO: ATTACHED SERVICE LIST

NOTICE IS HEREBY GIVEN that the foregoing motion shall come on for hearing before the Public Utilities Commission of the State of Hawaii in the hearing room at 465 South King Street, Honolulu, Hawaii, at _____ m. on _____, 2010, or as soon thereafter as counsel can be heard.

DATED: Honolulu, Hawaii, March 8, 2010

Erik Kvam

ERIK W. KVAM
Chief Executive Officer
Zero Emissions Leasing LLC

CERTIFICATE OF SERVICE

I hereby certify that I have this date filed and served the original and eight copies of the foregoing **MOTION OF ZERO EMISSIONS LEASING LLC TO COMPEL HAWAIIAN ELECTRIC COMPANIES TO PROVIDE RESPONSES TO INFORMATION REQUEST** in Docket No. 2008-0273, by hand delivery to the Commission at the following address:

CARLITO CALIBOSO
PUBLIC UTILITIES COMMISSION
465 S. King Street, Suite 103
Honolulu, HI 96813

I further certify that copies of the foregoing **MOTION OF ZERO EMISSIONS LEASING LLC TO COMPEL HAWAIIAN ELECTRIC COMPANIES TO PROVIDE RESPONSES TO INFORMATION REQUEST** have been served upon the following parties and participants by causing copies hereof to be hand delivered, mailed by first class mail or electronically transmitted to each such party as follows:

DEAN NISHINA
EXECUTIVE DIRECTOR
DEPARTMENT OF COMMERCE
AND CONSUMER AFFAIRS
DIVISION OF CONSUMER ADVOCACY
P.O. Box 541
Honolulu, HI 96809

2 copies
Via Hand Delivery

DARCY L. ENDO-MOTO
VICE PRESIDENT
GOVERNMENT & COMMUNITY AFFAIRS
HAWAIIAN ELECTRIC COMPANY, INC.
P.O. Box 2750
Honolulu, HI 96840-0001

Electronically Transmitted

DEAN MATSUURA
DIRECTOR, REGULATORY AFFAIRS
HAWAIIAN ELECTRIC COMPANY, INC.
P.O. Box 2750
Honolulu, HI 96840-0001

Electronically Transmitted

JAY IGNACIO
PRESIDENT
HAWAII ELECTRIC LIGHT COMPANY, INC.
P.O. Box 1027
Hilo, HI 96721-1027

Electronically Transmitted

EDWARD L. REINHARDT
PRESIDENT
MAUI ELECTRIC COMPANY, LIMITED
P.O. Box 398
Kahului, HI 96733-6898

Electronically Transmitted

ROD S. AOKI, ESQ.
ALCANTAR & KAHL LLP
120 Montgomery Street, Suite 2200
San Francisco, CA 94104

Counsel for HECO Companies

Electronically Transmitted

THOMAS W. WILLIAMS, JR., ESQ.
PETER Y. KIKUTA, ESQ.
DAMON L. SCHMIDT, ESQ.
GOODSILL ANDERSON QUINN & STIFEL
Alii Place, Suite 1800
1099 Alakea Street
Honolulu, HI 96813

Counsel for HECO Companies

Electronically Transmitted

THEODORE PECK
DEPARTMENT OF BUSINESS, ECONOMIC
DEVELOPMENT AND TOURISM
State Office Tower
235 South Beretania Street, Room 500
Honolulu, HI 96813

Electronically Transmitted

ESTRELLA SEESE
DEPARTMENT OF BUSINESS, ECONOMIC
DEVELOPMENT AND TOURISM
State Office Tower
235 South Beretania Street, Room 502
Honolulu, HI 96813

Electronically Transmitted

MARK J. BENNETT, ESQ.
DEBORAH DAY EMERSON, ESQ.

GREGG J. KINKLEY, ESQ.
DEPARTMENT OF THE ATTORNEY GENERAL
425 Queen Street
Honolulu, HI 96813

Counsel for DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT AND TOURISM

CARRIE K.S. OKINAGA, ESQ — Electronically Transmitted
GORDON D. NELSON, ESQ.
DEPARTMENT OF CORPORATION COUNSEL
CITY AND COUNTY OF HONOLULU
530 S. King Street, Room 110
Honolulu, HI 96813

Counsel for the CITY AND COUNTY OF HONOLULU

LINCOLN S.T. ASHIDA, ESQ. — Electronically Transmitted
WILLIAM V. BRILHANTE, JR., ESQ.
MICHAEL J. UDOVIC
DEPARTMENT OF THE CORPORATION COUNSEL
COUNTY OF HAWAII
101 Aupuni Street, Suite 325
Hilo, HI 96720

Counsel for the COUNTY OF HAWAII

HENRY Q. CURTIS — Electronically Transmitted
KAT BRADY
LIFE OF THE LAND
76 North King Street, Suite 203
Honolulu, HI 96817

CARL FREEDMAN — Electronically Transmitted
HAIKU DESIGN & ANALYSIS
4324 Hana Highway
Haiku, HI 96708

WARREN S. BOLLMEIER II — Electronically Transmitted
PRESIDENT
HAWAII RENEWABLE ENERGY ALLIANCE
46-040 Konane Place, # 3816
Kaneohe, HI 96744

DOUGLAS A. CODIGA, ESQ. — Electronically Transmitted
SCHLACK ITO LOCKWOOD PIPER & ELKIND

Topa Financial Center
745 Fort Street, Suite 1500
Honolulu, HI 96813

Counsel for BLUE PLANET FOUNDATION

MARK DUDA — Electronically Transmitted
PRESIDENT
HAWAII SOLAR ENERGY ASSOCIATION
P.O. Box 37070
Honolulu, HI 96837

ISAAC H. MORIWAKE, ESQ. — Electronically Transmitted
DAVID L. HENKIN, ESQ.
EARTHJUSTICE
223 South King Street, Suite 400
Honolulu, HI 96813-4501

Counsel for HAWAII SOLAR ENERGY ASSOCIATION

RILEY SAITO — Electronically Transmitted
THE SOLAR ALLIANCE
73-1294 Awakea Street
Kailua-Kona, HI 96740

JOEL K. MATSUNAGA — Electronically Transmitted
HAWAII BIOENERGY, LLC
737 Bishop Street, Suite 1860
Pacific Guardian Center, Mauka Tower
Honolulu, HI 96813

CAROLINE BELSOM — Electronically Transmitted
MAUI LAND & PINEAPPLE COMPANY, INC.
P.O. Box 187
Kahului, HI 96733-6687

KENT D. MORIHARA, ESQ. — Electronically Transmitted
KRIS N. NAKAGAWA, ESQ.
SANDRA L. WILHILDE, ESQ.
MORIHARA LAU & FONG LLP
841 Bishop Street, Suite 400
Honolulu, HI 96813

Counsel for HAWAII BIOENERGY, LLC and
MAUI LAND & PINEAPPLE COMPANY, INC.
THEODORE E. ROBERTS — Electronically Transmitted
SEMPRA GENERATION

101 Ash Street, HQ 10
San Diego, CA 92101-3017

JOHN N. REI — Electronically Transmitted
SOPOGY, INC.
2660 Waiwai Loop
Honolulu, HI 96819

GERALD A. SUMIDA, ESQ. — Electronically Transmitted
TIM LUI-KWAN, ESQ.
NATHAN C. NELSON, ESQ.
CARLSMITH BALL LLP
ASB Tower, Suite 2200
1001 Bishop Street
Honolulu, HI 96813

Counsel for HAWAII HOLDINGS, LLC, dba FIRST WIND HAWAII

CHRIS MENTZEL — Electronically Transmitted
CHIEF EXECUTIVE OFFICER
CLEAN ENERGY MAUI LLC
619 Kupulau Drive
Kihei, HI 96753

HARLAN Y. KIMURA, ESQ. — Electronically Transmitted
Central Pacific Plaza
220 South King Street, Suite 1660
Honolulu, HI 96813

Counsel for TAWHIRI POWER LLC

SANDRA-ANN Y.H. WONG, ESQ. — Electronically Transmitted
ATTORNEY AT LAW, A LAW CORPORATION
1050 Bishop Street #514
Honolulu, HI 96813

Counsel for ALEXANDER & BALDWIN, INC., through its division, HAWAIIAN COMMERCIAL & SUGAR COMPANY

DATED: Honolulu, Hawaii, March 8, 2010

ERIK KVAM